

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

EVOLVED WIRELESS, LLC,

Plaintiff,

v.

APPLE INC.,

Defendant.

C.A. No. 15-542-SLR

EVOLVED WIRELESS, LLC,

Plaintiff,

v.

HTC CORPORATION and  
HTC AMERICA, INC.,

Defendants.

C.A. No. 15-543-SLR

EVOLVED WIRELESS, LLC,

Plaintiff,

v.

LENOVO GROUP LTD.,  
LENOVO (U.S.) INC., and  
MOTOROLA MOBILITY,

Defendants.

C.A. No. 15-544-SLR

EVOLVED WIRELESS, LLC,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., and  
SAMSUNG ELECTRONICS AMERICA,

Defendants.

C.A. No. 15-545-SLR

EVOLVED WIRELESS, LLC,

Plaintiff,

v.

ZTE (USA) INC.,

Defendant.

C.A. No. 15-546-SLR

EVOLVED WIRELESS, LLC,

Plaintiff,

v.

MICROSOFT CORPORATION,  
MICROSOFT MOBILE OY, and  
NOKIA INC.,

Defendants.

C.A. No. 15-547-SLR

**DEFENDANTS' OPENING BRIEF IN SUPPORT OF  
THEIR MOTION FOR JUDGMENT ON THE PLEADINGS**

## TABLE OF CONTENTS

I.	Introduction.....	1
II.	Background.....	2
	A. The '916 Patent.....	2
	B. The '481 Patent.....	6
III.	Legal Standard .....	8
	A. Fed. R. Civ. P. 12(c) .....	8
	B. 35 U.S.C. § 101.....	8
IV.	Analysis.....	10
	A. The claims of the '916 Patent are patent ineligible.....	10
	Step 1: The claims are directed to an abstract idea. ....	10
	Step 2: The claims add nothing inventive. ....	13
	B. The claims of the '481 Patent are patent ineligible.....	18
	Step 1: The claims are directed to an abstract idea. ....	18
	Step 2: The claims add nothing inventive. ....	19
V.	Conclusion .....	20

## TABLE OF AUTHORITIES

### CASES

<i>Accenture Global Servs., GmbH v. Guidewire Software, Inc.</i> , 728 F.3d 1336 (Fed. Cir. 2013).....	10
<i>Alice Corp. Pty. Ltd. v. CLS Bank Int’l</i> , 134 S. Ct. 2347 (2014) .....	passim
<i>Ashcroft v. Iqbal</i> , 556 U.S. 662 (2009) .....	8
<i>Bancorp Servs. v. Sun Life Assurance Co. of Canada</i> , 687 F.3d 1266 (Fed. Cir. 2012).....	9
<i>Bilski v. Kappos</i> , 561 U.S. 593 (2010) .....	9
<i>buySAFE v. Google, Inc.</i> , 765 F.3d 1350 (Fed. Cir. 2014).....	15
<i>Content Extraction v. Wells Fargo Bank</i> , 776 F.3d 1343 (Fed. Cir. 2014).....	10, 16, 20
<i>Cyberfone Sys., LLC v. CNN Interactive Grp., Inc.</i> , 558 F. App’x 988 (Fed. Cir. 2014).....	14, 18
<i>CyberSource Corp. v. Retail Decisions, Inc.</i> , 654 F.3d 1366 (Fed. Cir. 2011).....	17
<i>DDR Holdings, LLC v. Hotels.com, L.P.</i> , 773 F.3d 1245 (Fed. Cir. 2014).....	12
<i>Diamond v. Diehr</i> , 450 U.S. 175 (1981) .....	1, 2, 18
<i>Enfish, LLC v. Microsoft Corp.</i> , 822 F.3d 1327 (Fed. Cir. 2016).....	12
<i>Erickson v. Pardus</i> , 551 U.S. 89 (2007) .....	8
<i>Gottschalk v. Benson</i> , 409 U.S. 63 (1972). .....	passim
<i>In re TLI Commc’ns LLC Patent Litig.</i> , 823 F.3d 607 (Fed. Cir. 2016).....	passim

<i>Intellectual Ventures I LLC v. Capital One Bank (USA)</i> , 792 F.3d 1363 (Fed. Cir. 2015).....	12
<i>Intellectual Ventures I LLC v. Symantec Corp.</i> , 100 F. Supp. 3d 371 (D. Del. Apr. 22, 2015) .....	16
<i>Internet Patents Corp. v. Active Network, Inc.</i> , 790 F.3d 1343 (Fed. Cir. 2015).....	9
<i>Le Roy v. Tatham</i> , 55 U.S. 156 (1852). ....	8
<i>Novo Transforma Tech., LLC v. Sprint Spectrum L.P.</i> , 14-612-RGA, D.I. 62 (D. Del. Sep. 2, 2015) .....	9
<i>OpenTV v. Apple</i> , 2015 WL 1535328 (N.D. Cal. Apr. 6, 2015) .....	15
<i>Parker v. Flook</i> , 437 U.S. 584 (1978) .....	passim
<i>Parus Holdings, Inc. v. Sallie Mae Bank</i> , 14-cv-1427-SLR, D.I. 32 (D. Del. Oct. 8, 2015).....	9
<i>Personalized Media Comm’s, LLC v. Amazon.com, Inc.</i> , 13-1608-RGA, D.I. 148 (D. Del. Aug. 10, 2015).....	9
<i>Personalized Media Commc’ns, LLC v. Amazon.com, Inc.</i> , 2015 WL 4730906 (D. Del. Aug. 10, 2015) .....	8, 19
<i>Rubber-Tip Pencil Co. v. Howard</i> , 87 U.S. 498 (1874) .....	8
<i>Ultramercial v. Hulu, LLC</i> , 772 F.3d 709 .....	9, 10, 17
<i>Visual Memory LLC v. Nvidia Corp.</i> , 15-789-RGA, 2016 WL 3041847 (D. Del. May 27, 2016) .....	15
<b>STATUTES</b>	
35 U.S.C. § 101 .....	2, 8
<b>RULES</b>	
Fed. R. Civ. P. 12(c) .....	8

## I. INTRODUCTION

The claims of U.S. Patent No. 7,746,916 (“the ’916 Patent”) and U.S. Patent No. 8,218,481 (“the ’481 Patent”) are patent ineligible on the pleadings under 35 U.S.C. § 101. For almost fifty years, the settled law of the United States has been that a patent claim that in “practical effect” covers a mathematical algorithm is not patent eligible. *Gottschalk v. Benson*, 409 U.S. 63, 71-72 (1972). Such a claim is directed to an abstract idea, and remains ineligible for patent protection even where limited “to a particular technological environment” or amended to include “insignificant postsolution activity.” *Diamond v. Diehr*, 450 U.S. 175, 191-92 (1981) (citing *Parker v. Flook*, 437 U.S. 584 (1978)). The Supreme Court has continually reaffirmed these foundational principles, including in its most recent pronouncement on patent eligibility. *See Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355 (2014) (reaffirming *Benson*, *Diehr*, and *Flook*).

In this case, Plaintiff alleges that Defendants infringe five patents, including the ’916 Patent and the ’481 Patent. (D.I. 1 at Counts I & V.)<sup>1</sup> Just as in *Benson* and *Flook*, the claims of the ’916 and ’481 Patents are directed to mathematical algorithms—specifically, methods of mathematically manipulating numerical sequences to generate new numerical sequences. The claims of the ’916 Patent, for example, require taking an initial sequence, performing a “cyclic extension” on it (*i.e.*, *copying* a portion of the sequence from one end to the other, such as from back to front) and then performing a “circular shift” on it (*i.e.*, *moving* a portion of the sequence from one end to another). (D.I. 1-1, ’916 Patent, at 17:35-58 (claim 1).) Similarly, the claims of the ’481 Patent require repeating a starting sequence to create a “consecutive sequence” and then adding a “cyclic prefix” (*i.e.*, copying a portion of the sequence from the back to the front). (D.I. 1-5, ’481 Patent, at 18:33-42 (claim 1).) The putative inventions at issue here are thus strikingly

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<sup>1</sup> All docket citations are to *Evolved Wireless, LLC v. ZTE Corp.*, 15-cv-546-SLR-SRF.

similar to the algorithm ruled ineligible in *Benson*, which started with storing a certain binary code, and then performed various shifting, adding, and masking steps to it. *See Benson*, 409 U.S. at 73-74.<sup>2</sup> As in *Benson*, the mathematical operations claimed here are not patent eligible.

Nor do any additional elements of the claims at issue here save them. For example, the '916 and '481 Patents' claim preambles stating that the mathematical algorithm is to be used "in a mobile communication system" or the step of "transmitting" the resulting code sequence "to [a] receiving party" ('916 Patent) or "receiving side" ('481 Patent) constitute nothing more than a limit to a "particular technological environment" or "insignificant postsolution activity," neither of which confers patentability to a mathematical algorithm. *Diehr*, 450 U.S. at 191-92 (citing *Flook*, 437 U.S. at 584). The claims at issue here are in "practical effect" directed to a mathematical algorithm itself, rather than to improvements on some preexisting technology. *Benson*, 409 U.S. at 71-72. They would have been patent ineligible decades ago under *Benson* and *Flook*, and they remain so today under *Alice*. The Court should therefore on the pleadings hold these claims to be patent-ineligible under 35 U.S.C. § 101.

## II. BACKGROUND

### A. The '916 Patent

The '916 Patent is directed to a method of and apparatus for transmitting a "code sequence." (D.I. 1-1 at 1:15-18.) These code sequences are merely patterns of numbers generated by a mathematical formula that are well known in the prior art for use in modulating and transmitting telecommunication signals. (*Id.* at 1:31-42.) For example, "[t]he following equation can be used to express an algorithm for generating a Zadoff-Chu CAZAC code" sequence. (*Id.* at

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<sup>2</sup> "The method of converting signals from binary coded decimal form into binary which comprises the steps of (1) storing the binary coded decimal signals ... (2) shifting the signals to the right ... (3) masking out said binary '1' ... (4) adding a binary '1' ... (5) shifting the signals to the left ... (6) adding a '1' to said first position, and (7) shifting the signals to the right ..." *Benson*, 409 U.S. at 73-74.

7:54-67.)

$$a^{\text{index}(A)}(n) = \begin{cases} \exp\left(i \frac{A\pi n(n+1)}{M}\right), & \text{when } M \text{ is odd} \\ \exp\left(i \frac{A\pi n^2}{M}\right), & \text{when } M \text{ is even} \end{cases}$$

where  $n = 0, 1, 2, \dots, M - 1$

The '916 Patent has 11 claims, including method claims 1-5 and 11 and apparatus claims 6-10.<sup>3</sup> (*Id.* at 17:35-18:65.) Claim 1 is provided below with annotations (a)-(f). (*Id.* at 17:35-57.)

1. A method for transmitting a code sequence from a transmitting party to a receiving party in a wireless communication system, the method comprising:

- (a) acquiring a code sequence having a second length by a cyclic extension of a code sequence having a first length;
- (b) performing a circular shift to the code sequence having the second length; and
- (c) transmitting the circular shifted code sequence having the second length to the receiving party,
- (d) wherein the first length is a largest prime number smaller than the second length, and
- (e) wherein the cyclic extension of the code sequence having the first length is performed such that a part of the code sequence having the first length, having a length corresponding to a difference between the first length and the second length, is added to either a start or an end of the code sequence having the first length, and
- (f) wherein the circular shift is performed to the code sequence having the second length such that either a rear portion of the code sequence having the second length moves to a start of the code sequence having the second length, or a front portion of the code sequence having the second length moves to an end of the code sequence having the second length.

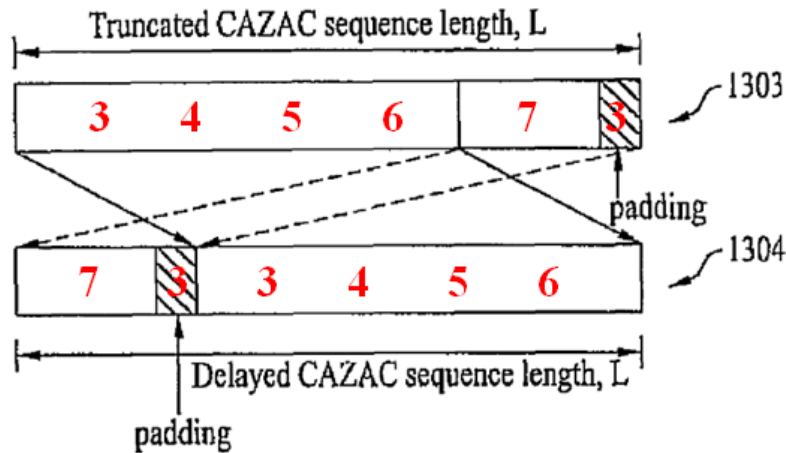
Beyond the preamble, claim 1 recites three steps, annotated (a)-(c), and three “wherein clauses,” annotated (d)-(f). Step (a) is to “acquire” a code sequence by performing a

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<sup>3</sup> Evolved asserts claims 1, 2, 4-7, 9 and 10.



mathematical operation called a *cyclic extension* on a starting code sequence. The cyclic extension copies the front of the starting sequence to its end (or copies the end of the starting sequence to its front). (*Id.* at 17:46-50.) For example, a cyclic extension of the sequence “34567” yields “345673” because the “3” at the front of “34567” is copied to the end, as illustrated by item 1303 in the annotated Fig. 13 below:



(*Id.* at Fig. 13 (annotated); see also *id.* at 12:37-49.)

Step (b) requires another mathematical operation called a *circular shift*, which shifts the cyclically extended sequence by moving a portion of the sequence from one end of the sequence to the opposite end. (*Id.* at 11:25-29.) For example, as demonstrated by item 1304 in the annotated Fig. 13 above, a circular shift of “345673” yields “733456” because the “73” at the end of the sequence is moved to the front of the sequence and the remaining numbers are shifted to the right.

The remaining elements of the claim add nothing beyond requiring that the resulting sequence be transmitted and further specifying the mathematical starting sequences and operations to be used. Step (c), for example, requires only the transmission of the circular-shifted code sequence “to the receiving party.” Element (d) requires the starting sequence to have a length that is a prime number (as in the example above, because “34567” has a length of five

digits, and five is a prime number). Elements (e) and (f) specify that the mathematical operations of cyclic extension and circular shift can be carried out on either the front or the back of the sequence (*i.e.*, either the front or the back of the sequence can be extended, and the circular shift can comprise moving the back to the front, or the front to the back).

The other claims of the '916 Patent are directed to the same or a similar mathematical algorithm. Independent method claim 11, for example, includes most of the same requirements as claim 1, but reverses the order of the cyclic extension and the circular shift as compared to claim 1. Independent apparatus claim 6 includes language nearly identical to that of claim 1 but couches the mathematical operations of cyclic extension and circular shift in terms of the capabilities of a generic structural component called “a code sequence generator,” and adds “a transmitting unit” with the ability to transmit.<sup>4</sup>

Similarly, the dependent claims add nothing that would confer patentability over the mathematical algorithm. Claims 2-4 and 7-8 merely specify that the starting sequence includes “at least a cyclic prefix or a cyclic postfix” (meaning an additional sequence portion at either the front or back, respectively; '916 Patent at 10:37-41, 12:44-45) or constitutes a “Zadoff-Chu (ZC) sequence” (a particular type of prior art mathematical sequence; *id.* at 1:31-42). Claims 5 and 10 merely require that the resulting code sequence be transmitted “as a reference signal sequence” (a term the specification equates with a prior art signal in a wireless communications system; '916 Patent at 1:19-26). Thus, at the core of every claim of the '916 Patent is the mathematical algorithm of cyclically extending and circularly shifting a numerical sequence. None of the claims adds anything other than entirely generic structures or functionality.

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<sup>4</sup> Plaintiff contends that the “code sequence generator” and “transmitting unit” of claim 6 should be construed as “hardware and/or software in the apparatus that is capable of” performing the recited functions. (D.I. 68 at 2, 9.)

## B. The '481 Patent

Similar to the '916 Patent, the '481 Patent is directed to a method of transmitting a mathematical sequence, called a “preamble sequence,” in a mobile communication system. (D.I. 1-5, '481 Patent, at 1:16-20, 18:33-42.)<sup>5</sup> The patent discloses that the preamble sequence can be a prior art mathematical sequence known as a “Constant Amplitude Zero Auto Correlation,” or CAZAC sequence. (*Id.* at 1:32-34; 12:23-26.)

As shown below, claim 1 of the '481 Patent has three steps.

1. A method of transmitting a preamble sequence in a mobile communication system, the method comprising:

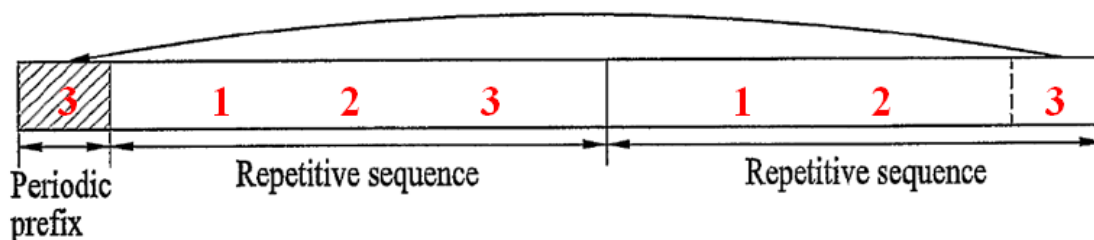
repeating a specific sequence, having a length (L), N times to generate a consecutive sequence having a length (N\*L);

generating said preamble sequence by concatenating a single cyclic prefix (CP) to a front end of said consecutive sequence; and

transmitting, on a random access channel, said preamble sequence to a receiving side.

(*Id.* at 18:33-42.)

The first step merely repeats a starting sequence (“a specific sequence”) some number of times (*i.e.*, “N times”) to generate a “consecutive sequence.” Thus, for example, a starting sequence of “123” could be repeated twice (N=2) to create the consecutive sequence “123123,” as illustrated by the annotated Fig. 11 below:



(*Id.* at Fig. 11 (annotated); *see also id.* at 11:60-64.)

The second step requires adding a “cyclic prefix” to the front of the consecutive

<sup>5</sup> Evolved asserts claims 1-4, 6, 8-11, and 13.

sequence. As the '481 Patent makes clear, adding a “cyclic prefix” means nothing more than copying some portion at the end of the sequence to the front of the sequence. (D.I. 1-5 at 11:56-60.) Thus, in the example above, adding a cyclic prefix to the consecutive sequence “123123” could result in “3123123,” where the last digit (3) has been copied to the front of the sequence. Mathematically, this is equivalent to the cyclic extension in the '916 Patent. (D.I. 1-1 at 10:37-41.)

The last step requires transmitting the sequence “on a random access channel . . . to a receiving side.” As the '481 Patent confirms in its Background Art section, a random access channel is simply a well-known transmission channel in prior art communications systems. (*Id.* at 1:24-26.)

The other claims of the '481 Patent are directed to the same mathematical algorithm. For example, the only other independent claim, claim 8, includes language nearly identical to that of claim 1 but couches the mathematical operations of repeating a sequence and adding a cyclic prefix in terms of the capabilities of a generic structural component called “a preamble generation unit,” and adds “a transmitting unit” with the ability to transmit the resulting sequence on a random access channel.<sup>6</sup> As with the '916 Patent, the dependent claims of the '481 Patent add nothing that would confer patentability over the mathematical algorithm. Claims 2 and 9 merely specify that the starting “specific sequence” is a prior art CAZAC sequence. (*See, e.g., Id.* at 1:32-34.) Claims 3-7 and 10-14 require a cyclic shift involving various additional mathematical operations. Claims 15-16 require a certain number of repetitions and a specific length of the cyclic prefix. Thus, at the core of every claim of the '481 Patent is the algorithm of

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<sup>6</sup> As with the '916 Patent, Plaintiff contends that “preamble generation unit” and “transmitting unit” should be construed to mean “hardware and/or software capable of” performing the recited functions. (D.I. 68 at 3, 14-15.)

repeating a mathematical sequence and adding a cyclic prefix. None of the claims includes anything beyond variations of those mathematical operations or entirely generic structures.

### III. LEGAL STANDARD

#### A. Fed. R. Civ. P. 12(c)

A Rule 12(c) motion for judgment on the pleadings is reviewed under the same standard as a Rule 12(b)(6) motion where, as here, the Rule 12(c) motion alleges that plaintiff failed to state a claim upon which relief can be granted. *See Personalized Media Commc'ns, LLC v. Amazon.com, Inc.*, 2015 WL 4730906, at \*1 (D. Del. Aug. 10, 2015). “The court must accept the factual allegations in the complaint and take them in the light most favorable to the non-moving party.” *Id.* (citing *Erickson v. Pardus*, 551 U.S. 89, 94 (2007)). “The court must ‘draw on its judicial experience and common sense’ to make the determination. *Id.* (quoting *Ashcroft v. Iqbal*, 556 U.S. 662, 679 (2009)).

#### B. 35 U.S.C. § 101

Section 101 provides that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions of this title.” 35 U.S.C. § 101. Section 101 has three exceptions: “laws of nature, physical phenomena, and abstract ideas.” *Benson*, 409 U.S. at 67. Pertinent here is the third category, “abstract ideas,” which embodies the longstanding rule that “an idea of itself is not patentable.” *Id.* (quoting *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874)). This is because “[a] principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.” *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852).

These long-standing principles still apply today. *See Alice*, 134 S. Ct. at 2354-55 (citing *Le Roy*, 55 U.S. at 175). In *Alice*, the Supreme Court reiterated its two-step framework for

determining whether patent claims are directed to an abstract idea or other patent-ineligible concept. *Alice*, 134 S. Ct. at 2355. First, courts must determine if the claims at issue are directed to a patent-ineligible concept. *Id.* If so, the next step is to look for an “‘inventive concept’—*i.e.*, an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.” *Id.*

Subject matter eligibility under Section 101 is a “threshold test,” *Bilski v. Kappos*, 561 U.S. 593, 602 (2010), and a “primal inquiry, one that must be addressed at the outset of litigation,” *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 718 (Fed. Cir. 2014) (Mayer, J., concurring). Because patent eligibility under Section 101 is a question of law, courts in this district have routinely recognized the propriety of disposing of a case on Section 101 grounds at the pleading stage. *See, e.g., Parus Holdings, Inc. v. Sallie Mae Bank*, 14-cv-1427-SLR, D.I. 32 (D. Del. Oct. 8, 2015); *Novo Transforma Tech., LLC v. Sprint Spectrum L.P.*, 14-612-RGA, D.I. 62 (D. Del. Sep. 2, 2015); *Personalized Media Comm’s, LLC v. Amazon.com, Inc.*, 13-1608-RGA, D.I. 148 (D. Del. Aug. 10, 2015). The Federal Circuit has regularly affirmed Rule 12 dismissals based on patent-ineligible subject matter. *See, e.g., Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1349 (Fed. Cir. 2015) (affirming Rule 12 determination of ineligibility); *Ultramercial*, 772 F.3d at 712 (same).

Claim construction is not a prerequisite to determining Section 101 eligibility. Rather, patent-eligibility is a threshold issue that a court may consider prior to construction. *See Bancorp Servs. v. Sun Life Assurance Co. of Canada*, 687 F.3d 1266, 1273 (Fed. Cir. 2012) (finding “no flaw in the notion that claim construction is not an inviolable prerequisite to a validity determination under 101”). No formal claim construction is required where, as here, the asserted claims disclose “no more than ‘an abstract idea garnished with accessories’” and there is “no

‘reasonable construction that would bring them within patentable subject matter.’” *Ultramercial*, 772 F.3d at 719 (Mayer, J., concurring).<sup>7</sup>

#### IV. ANALYSIS

For the reasons described below, Defendants respectfully move for Rule 12(c) judgment of invalidity on the pleadings that the claims of the ’916 and ’481 Patents are invalid under § 101. This motion is timely because, with the filing of Plaintiff’s Answer to Samsung’s Counterclaims (D.I. 71, Case No. 1:15-cv-00545) on July 7, 2016, the pleadings are now closed in all six related cases.

##### A. The claims of the ’916 Patent are patent ineligible.

###### **Step 1: The claims are directed to an abstract idea.**

Step 1 of the *Alice* analysis is to determine if the claims are directed to a patent-ineligible concept, such as an abstract idea. *See Alice*, 134 S. Ct. at 2355. The goal of this step is to identify the “basic concept” or the “heart” of the claims. *See Content Extraction v. Wells Fargo Bank*, 776 F.3d 1343, 1347 (Fed. Cir. 2014) (reducing claims elements to the ‘basic concept of data recognition and storage’); *Ultramercial*, 772 F.3d at 714-15 (determining “heart” of patent-in-suit was abstract). Regardless of how complex the patent specification is, “the important inquiry for a § 101 analysis is to look at the claims.” *Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1345 (Fed. Cir. 2013).

The ’916 Patent claims are directed to a mathematical algorithm for generating a code sequence. The steps of method claims 1 and 11, for example, require two mathematical operations (a cyclic extension and a circular shift) and the transmission of the result “to the

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<sup>7</sup> No claim construction issue should delay the resolution of this motion. Plaintiff takes the position that the generic structural elements of claim 6 of the ’916 Patent and claim 8 of the ’481 Patent should be construed as “hardware and/or software” for performing their recited functions. (See D.I. 57-1 at 1-3, 18-20.)

receiving party.” The additional “wherein clauses” do nothing more than further define the starting sequence or the mathematical operations. Apparatus claim 6 captures those same operations in the capabilities of generic structural components phrased as nonce words such as “unit” and “generator” that even Plaintiff asserts require nothing more than “hardware and/or software.” (D.I. 68 at 2, 9.) The dependent claims merely further define the mathematical sequences and how the transmission is used. The heart and soul of these claims is thus the mathematical algorithm performed on a starting sequence to obtain a resulting sequence. Such a mathematical algorithm is an abstract idea under long-established Supreme Court precedent.

In *Benson*, for example, the Supreme Court rejected as ineligible patent claims to a mathematical algorithm for converting a binary-coded decimal numeral into pure binary code because those claims, which were directed to the shifting, adding and masking of sequences of binary numbers, amounted to “a patent on the algorithm itself.” *Benson*, 409 U.S. at 71-72. Similarly, in *Flook*, the Supreme Court held that a mathematical formula for computing alarm limits in a catalytic conversion process was a patent-ineligible abstract idea. *Flook*, 437 U.S. at 594-95. Although the claimed process was aimed at “the catalytic chemical conversion of hydrocarbons,” *id.* at 596, the Court invalidated the claim, finding that “[i]f a claim is directed *essentially* to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.” *Id.* at 595 (emphasis added). As in *Benson* and *Flook*, the claims of the ’916 Patent amount to a patent on the mathematical operations of cyclic extension and circular shifting. The addition of claim limitations calling out transmission of a reference signal in a wireless transmission system does not avoid that conclusion. The claims at issue here are thus squarely within the excluded zone of ideas that may not be patented.

This conclusion is consistent with the Federal Circuit’s recent decision in *Enfish, LLC v.*



*Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016). In *English*, for example, the court emphasized the distinction between claims directed to “use of an abstract mathematical formula on any general purpose computer” and claims “directed to an improvement to computer functionality.” *Id.* at 1335, 1338. The claims of the ’916 Patent say nothing of any improvement to the functionality of a computer. The mathematical operations they recite would be carried out in the same manner as any other mathematical operations. Indeed, neither the claims nor the specification of the ’916 Patent ever refer to any specific type of hardware or software. Nor do they purport to describe any modification of any hardware or software that could be called an improvement to computer functionality.<sup>8</sup> Rather, the focal point of both the claims and the specification is a mathematical algorithm, including cyclic extension and circular shift, that may be used to generate a code sequence from a starting code sequence.

Moreover, beyond the claim language defining the mathematical operations there is nothing in the method claims except the preamble statement referring to use in “a wireless communications system”—a broad and generic technological context—and the requirement that the resulting sequence be transmitted “to the receiving party”—insignificant post-solution activity at best. As a matter of law, such language cannot bring the claimed mathematical algorithm within the ambit of Section 101. *Flook*, 437 U.S. at 590; *In re TLI Commc’ns LLC Patent Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016) (“[A]lthough the claims limit the abstract idea to a particular environment—a mobile telephone system—that does not make the claims any less abstract for the step 1 analysis”).

Nor do the apparatus claims recite any new structure that could constitute an

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<sup>8</sup> Nor do the claims attempt to solve “a challenge particular to the Internet.” *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1256-57 (Fed. Cir. 2014). Thus, *DDR Holdings* “has no applicability.” *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1371 (Fed. Cir. 2015).

improvement in the field. The patent specification never describes any hardware or software making up a “code sequence generator” or “transmitting unit.” Indeed, the specific claim language employed recites only nonce terms, such as “unit” and “generator,” that require no particular structure whatsoever—as even Plaintiff must admit, given its proposed interpretations. Thus, these “recited physical components merely provide a generic environment in which to carry out the abstract idea of” the claimed mathematical algorithm. *In re TLI*, 823 F.3d at 611 (holding claims directed to an abstract idea despite recitation of “tangible components such as ‘a telephone unit’ and a ‘server’”).

That leaves only the claimed mathematical operations themselves, but they cannot be the “improvement to computer functionality” that the court in *Enfish* sought. “Whether the algorithm was in fact known or unknown at the time of the claimed invention, as one of the ‘basic tools of scientific and technological work,’ *it is treated as though it were a familiar part of the prior art.*” *Flook*, 437 U.S. at 591-92 (emphasis added) (quoting *Benson*, 409 U.S. at 67).

Thus, decades-old Supreme Court precedent, squarely on point, requires a finding that the claims of the ’916 Patent are directed to a mathematical algorithm, an abstract idea. Nothing in the Federal Circuit’s more recent decisions provides support for any contrary conclusion.

**Step 2: The claims add nothing inventive.**

Step 2 of the *Alice* analysis is “to look for an ‘inventive concept’—*i.e.*, an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.” *Alice*, 134 S. Ct. at 2355. In the ’916 Patent claims, there is nothing beyond the mathematical operations of cyclic extension and circular shift except entirely conventional and generic structures and functionality.

**a. The method claims add nothing inventive.**

The method claims are devoid of structure. In independent claim 1, a “transmitting party”

acquires a code sequence, performs two mathematical operations on it, and transmits the result to a “receiving party.” (See D.I. 1-1 at 17:35-57.) Such transmitting and receiving parties are not specific to any person or thing. As claimed, these generic “parties” are no different from those required for the transmission of anything, from a code sequence to the common cold. Even if these terms were limited to “hardware and/or software” for transmitting and receiving, they would still be “purely functional and generic” and—like the components in *Alice*—insufficient to render the claims patent-eligible. *Alice*, 134 S. Ct. at 2360 (“Nearly every computer will include a ‘communications controller’ and a ‘data storage unit’ capable of performing the basic calculation, storage, and transmission functions required by the method claims.”); see also *In re TLI*, 823 F.3d at 614 (holding components performing “basic computer functions such as sending and receiving data” do not impart patent-eligibility); *Cyberfone Sys., LLC v. CNN Interactive Grp., Inc.*, 558 F. App’x 988, 992 (Fed. Cir. 2014) (“[U]sing categories to organize, store, and transmit information is well-established.”). Method claim 11 is potentially even broader because it omits the “transmitting party” and “receiving party,” (see D.I. 1-1 at 18:44-65), and neither claim recites any other structure, whether of patentable weight or otherwise. Untethered from structure, the method claims fail the machine-or-transformation test<sup>9</sup> and fail to supply the inventive concept that is “sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [algorithm] itself” that *Alice* requires. *Alice*, 134 S. Ct. at 2355.

Nor do the preambles save the method claims from invalidity. The preambles call for transmitting a code sequence “in a wireless communication system.” (D.I. 1-1 at 17:35-37, 18:44-45.) Even if the preambles were to limit the claims, they would still be insufficient because

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<sup>9</sup> “While the Supreme Court has held that the machine-or-transformation test is not the sole test governing § 101 analyses, *Bilski*, 561 U.S. at 604, that test can provide a ‘useful clue’ in the second step of the *Alice* framework.” *Ultramercial, Inc.*, 772 F.3d at 716 (citing *Bancorp Servs., L.L.C., v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1278 (Fed. Cir. 2012)).

“the prohibition against patenting abstract ideas cannot be circumvented by attempting to limit the use of the idea to a particular technological environment.” *Alice*, 134 S. Ct. at 2358 (summarizing *Flook*’s holding).

The step of transmitting the code sequence also does not impart patent-eligibility. Transmitting a code sequence “is not even arguably inventive.” *See buySAFE v. Google, Inc.*, 765 F.3d 1350, 1355 (Fed. Cir. 2014) (rejecting the argument that receiving and sending information over a network is inventive); *In re TLI*, 823 F.3d at 614 (same). It is simply a “conventional step[], specified at a high level of generality, [which is] not *enough* to supply an inventive concept.” *Alice*, 134 S. Ct. at 2357 (quotation marks omitted; emphasis in original).

Similarly, the term “code sequence” cannot impart patent-eligibility. A code sequence is not an inventive concept. *See, e.g., OpenTV v. Apple*, 2015 WL 1535328, at \*3 (N.D. Cal. Apr. 6, 2015) (finding claims that described using identifications codes were directed to a patent-ineligible abstract idea). The ’916 Patent itself admits that prior art “preamble” signals were “comprised of a code sequence.” (D.I. 1-1 at 1:23.) Indeed, the ’916 Patent cites the seminal 1972 paper by mathematician David C. Chu, which first articulated the type of CAZAC code sequences (called CAZAC sequences) that the ’916 Patent describes and claims. (*See id.* at 1:38-40 (citing Chu, “Polyphase Codes with Good Periodic Correlation Properties,” *Information Theory IEEE Transaction* on, vol. 18, issue 4, pp. 531-532, July 1972).) Thus, the transmission of such code sequences was purely conventional long before the ’916 Patent’s priority date and cannot amount to the inventive concept that Step 2 of *Alice* requires. *See Alice*, 134 S.Ct. at 2359; *see also Visual Memory LLC v. Nvidia Corp.*, 15-789-RGA, 2016 WL 3041847, at \*7 (D. Del. May 27, 2016) (holding that, where “[t]he specification acknowledges that [generic] components were known in the art,” such components cannot express an “inventive concept”

under *Alice* step two).

Finally, although the Court need not address the dependent claims individually,<sup>10</sup> those claims add nothing beyond “well-understood, routine, conventional activit[ies]” that were “previously known to the industry.” *See Alice*, 134 S. Ct. at 2359. Claims 2-3 add no structure, but merely specify details about one of the mathematical operations (the cyclic extension) in the mathematical algorithm of claim 1. (*See* D.I. 1-1 at 18:7-28.) Claim 4 recites that the starting sequence is a particular type of sequence known as the Zadoff-Chu sequence, but the patent itself acknowledges that Zadoff-Chu sequences have long been known in the art. (*See id.* at 1:38-42.) Similarly, claim 5 recites that the transmitted code sequence is a “reference signal sequence,” which, as the patent acknowledges, was also known in the art. (*See id.* at 1:20-22.) “Thus, while these claims may have a narrower scope than [representative claim 1], no claim contains an ‘inventive concept’ that transforms the corresponding claim into a patent-eligible application of the otherwise ineligible abstract idea.” *Content Extraction*, 776 F.3d at 1349.

**b. The apparatus claims add nothing inventive.**

The conclusion of invalidity holds with equal force for the apparatus claims. *Alice*, 134 S. Ct. at 2360 (“This Court has long ‘warn[ed] . . . against’ interpreting 101 ‘in ways that make patent eligibility ‘depend simply on the draftsman’s art.’”). As in *Alice*, the apparatus claims are “no different from the method claims in substance.” *Id.* The method claims recite an abstract idea untethered from structure, and the apparatus claims “recite a handful of generic computer components configured to implement the same idea.” *Id.* As noted above, claim 6 recites “a code sequence generator” and “a transmitting unit,” which Plaintiff contends require nothing beyond

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<sup>10</sup> “Addressing each of the asserted claims is unnecessary” where, as here, “‘all the claims are ‘substantially similar and linked to the same abstract idea.’” *Intellectual Ventures I LLC v. Symantec Corp.*, 100 F. Supp. 3d 371, 391 (D. Del. Apr. 22, 2015) (quoting *Content Extraction*, 776 F.3d at 1348 (approving analysis of representative claims)).

“hardware and/or software.” Such components are “purely functional and generic,” like the components in *Alice*, and fail to supply the inventive concept that *Alice* requires. *See Alice*, 134 S. Ct. at 2360; *see also In re TLI*, 823 F.3d at 614-615 (holding that “image analysis unit” and “control unit” components failed step 2 of *Alice*, because “the specification limits its discussion of these components to abstract functional descriptions devoid of technical explanation as to how to implement the invention”).<sup>11</sup>

Apparatus claim 6 also fails the machine-or-transformation test. First, claim 6 is not tied to a particular machine or apparatus. While claim 6 recites a “code sequence generator” and “transmitting unit,” it defines those terms only by reference to the functions they perform—functions any generic computer can perform. (*See* D.I. 1-1 at 18:7-28.) This incidental reliance on computers does not satisfy the “particular machine” test. *See, e.g., Ultramercial*, 772 F.3d at 716-17; *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373, 1375 (Fed. Cir. 2011). Second, claim 6 does not transform any article into a different state or thing. The apparatus of claim 6 merely recites the ability to manipulate a code sequence and transmit it. But “the mere manipulation or reorganization of data ... does not satisfy the transformation prong.” *CyberSource*, 654 F.3d at 1375. Therefore, claim 6 “amount[s] to ‘nothing significantly more’ than an instruction to apply the abstract idea ... using some unspecified, generic computer component”—which is “not ‘enough’ to transform [the] abstract idea into a patent-eligible invention.” *Alice*, 134 S. Ct. at 2360 (citation omitted) (emphasis in original). Therefore, under *Alice* step 2, no claim element or combination of elements transforms the patent-ineligible

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<sup>11</sup> Defendants contend that these terms are means-plus-function limitations for which the specification provides no corresponding structure. At most, these terms recite conventional structures well-known in the art. Indeed, the '916 Patent explains that the prior art included the generation and transmission of code sequences and does not suggest that the invention employs any new structures to perform those functions. (D.I. 1-1 at 1:20-47.)

algorithm into something patent-eligible. Thus, like the method claims, the apparatus claims contain no inventive concept, but instead are directed to the mathematical algorithm itself.

For the same reasons noted above with respect to the dependent method claims of the '916 Patent, the dependent apparatus claims also fail to provide any inventive concept that would impart patent eligibility. Specifically, dependent apparatus claims 7, 8, 9, and 10 differ in no meaningful regard from dependent method claims 2, 3, 4, and 5, respectively.

**B. The claims of the '481 Patent are patent ineligible**

**Step 1: The claims are directed to an abstract idea.**

Like the '916 Patent's claims, the '481 Patent's claims are directed to a mathematical algorithm for generating a sequence. The steps of claim 1 require the performance of two mathematical operations (repeating a sequence and adding a cyclic prefix) and the transmission of the resulting sequence on a well-known type of transmission channel "to the receiving side." Apparatus claim 8 captures those same operations in the capabilities of generic structural components phrased using the nonce word "unit," and the dependent claims only further define the mathematical sequences and operations employed. Just as with the '916 Patent, the heart and soul of the 481 Patent's claims is the mathematical algorithm.

Moreover, beyond the claim language reciting mathematical operations, there is nothing in the method claims except the preamble statement referring to use in "a mobile communication system" and the requirement that the resulting sequence be transmitted on a conventional random access channel "to the receiving side." Such attempts to limit the claims to a particular technological environment or to add insignificant post-solution activity cannot avoid a finding of ineligibility. *Diehr*, 450 U.S. at 191-92 (citing *Flook*, 437 U.S. at 584); *In re TLI*, 823 F.3d at 611, 614; *Cyberfone*, 558 F. App'x at 992.

Nor do the apparatus claims recite any new structure that could constitute an

improvement in the field. As with the '916 Patent, the '481 Patent specification does not describe any improved hardware or software. The claim language uses only the nonce word “unit,” which requires no particular structure whatsoever. Thus, just as with the '916 Patent, the Supreme Court’s *Benson*, *Flook*, and *Alice* decisions require a finding that the claims of the '481 Patent are directed to a mathematical algorithm and therefore to an abstract idea.

Like the '916 Patent, the '481 Patent claims are not saved by the Federal Circuit’s *Enfish* decision. The claims of the '481 Patent recite mathematical operations that may be carried out just as any other mathematical operations. Unlike the *Enfish* claims, the '481 Patent claims say nothing of any improvement to the functionality of a computer—or to “a challenge particular to the Internet,” *DDR Holdings*, 773 F.3d at 1256-57—and do not even recite any specific type of hardware or software. They are directed only to an unpatentable mathematical algorithm.

**Step 2: The claims add nothing inventive.**

The claims of the '481 Patent do not include anything beyond an abstract idea. Claim 1 recites nothing beyond the mathematical algorithm other than a “mobile communication system,” a “random access channel,” and a “receiving side”—all completely conventional prior art structures, phrased as broadly and generically as possible, that cannot provide the inventive concept required for patent eligibility. *See Alice*, 134 S.Ct. at 2359; *Visual Memory*, 2016 WL 3041847, at \*7. For example, the “random access channel” limitation recited in claim 1 was well known in the prior art, as the '481 Patent acknowledges in its “Background Art” section. (D.I. 1-5, '481 Patent, at 1:24-26.) The specification similarly acknowledges that a “preamble sequence” was also known in the prior art. (*Id.* at 1:23-2:33.) Independent claim 8 uses only the nonce term “unit,” which even Plaintiff asserts is generic “hardware and/or software.” (D.I. 57-1 at 1-3, 18-20.) This is insufficient to provide patent eligibility. *See In re TLI*, 823 F.3d at 614-615.

Again, the Court need not address the dependent claims individually, but those claims add



nothing patentable. *See Alice*, 134 S. Ct. at 2359. Claims 2, 9, and 15-16 merely specify starting the mathematical algorithm with particular types of sequences, and claims 3 and 10 just add further mathematical operations. Similarly, claims 4-7 and 11-14 recite further non-inventive details of the algorithm. These dependent claims may be narrower than the independent claims, but they fall far short of claiming patent-eligible applications of the otherwise ineligible algorithm. *See Content Extraction*, 776 F.3d at 1349. There is therefore no “element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [mathematical algorithm] itself.” *Alice*, 134 S. Ct. at 2355.

## V. CONCLUSION

The claims of the '916 and '481 Patents are directed to a mathematical algorithm, a patent-ineligible abstract idea under pre- and post-*Alice* Supreme Court precedent. The Court should grant Defendants' motion for judgment on the pleadings and enter judgment holding those claims invalid under 35 U.S.C. § 101 and dismissing Counts I and V of Plaintiff's complaints.

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